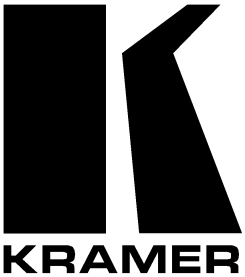
Kramer Electronics, Ltd.



USER MANUAL

Model:

Cobra MX-1616

16x16 Matrix Switcher / DA

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1 Introduction

Welcome to Kramer Electronics (since 1981): a world of unique, creative and affordable solutions to the infinite range of problems that confront the video, audio and presentation professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 500-plus different models now appear in 8 Groups[1], which are clearly defined by function.

Congratulations on purchasing your Kramer **Cobra MX-1616** *16x16 Matrix Switcher / DA*. The **Cobra MX-1616** *16x16 Matrix Switcher / DA* is designed for Plug and Play operation and is fully compatible with all versions of the Kramer **Cobra** series CAT5 transmitters/receivers.

The Kramer **Cobra** series products are not compatible with Kramer non-**Cobra** series products.

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual

3 Overview

Achieving the best performance when using the **Cobra MX-1616** *16x16 Matrix Switcher / DA* means:

- Connecting only good quality connection cables, thus avoiding interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Avoiding interference from neighboring electrical appliances that may adversely influence signal quality and positioning your **Cobra MX-1616** in a location free from moisture and away from excessive sunlight and dust

1 GROUP 1: Distribution Amplifiers; GROUP 2: Video and Audio Switchers, Matrix Switchers and Controllers; GROUP 3: Video, Audio, VGA/XGA Processors; GROUP 4: Interfaces and Sync Processors; GROUP 5: Twisted Pair Interfaces; GROUP 6: Accessories and Rack Adapters; GROUP 7: Scan Converters and Scalers; and GROUP 8: Cables and Connectors

Caution – No operator-serviceable parts inside unit.

Warning – Use only the Kramer Electronics input power wall adapter that is provided with this unit[1].

Warning – Disconnect power and unplug unit from wall before installing or removing device or servicing unit.

Warning – This equipment is not intended for, nor does it support, distribution through an Ethernet network. Do not connect these devices to any sort of networking or telecommunications equipment! Note, CAT5 cabling must be pinned to the TIA-EIA T568B wiring specification.

4 Cobra MX-1616 16x16 Matrix Switcher / DA Operation

This section describes how to operate the **Cobra MX-1616** *16x16 Matrix Switcher / DA*.

4.1 Keypad Description

The **Cobra MX-1616** *16x16 Matrix Switcher / DA* provides a front-panel keypad that may be used to configure the input to output channel assignments. Additionally, these assignments may be saved as preset configurations. 16 configurations may be saved for later use.

When an input or output channel is selected, the key will be illuminated. Pressing an input or output key will "toggle" the selection. It is not necessary to press the CANCEL key to remove only the selected key from the current assignment. The CANCEL key is used to abort any operation in progress, and will also re-initialize all input and output key selections. The ENTER key will update the matrix assignments with the current selection.

The **Cobra MX-1616** *16x16 Matrix Switcher / DA* will "remember" the current preset configuration if power is removed, and will return to this state when power is restored. If the current configuration has not been saved as a preset however, the unit will recall the last saved preset.

An 16 by 16 display is furnished to provide the user with a visual overview of the current matrix assignments.

1 For example: model number AD2512C, part number 2535-000251

4.2 Input to Output Assignment

To assign an input channel (source) to an output channel (destination), press the desired input key on the top row, and the desired output key(s) on the bottom row of the selection keypad. If any outputs are assigned to the selected input channel, the keys will be illuminated. When all assignments have been made, press the ENTER key to update the matrix, or press the CANCEL key to start again.

Multiple output channels may be assigned to a single input channel, but only one input channel may be assigned to each output channel. To turn an output channel off, press only the output key, then the ENTER key.

Pressing an input or output key will "toggle" the selection. It is not necessary to press the CANCEL key to remove only the selected key from the current assignment.

Pressing an input key will illuminate the input key and all outputs assigned to this input. To re-assign the outputs to a new input, press the input key again, then press the new input key. Press the ENTER key to update the matrix, or press the CANCEL key to start again.

To turn an output channel off, make sure no inputs are selected, then press only the output key, and the ENTER key.

4.3 Preset Command

To save the current matrix configuration, press the PRESET key, then the input key that corresponds to the preset you wish to overwrite (1 – 16). Press the ENTER key to save or the CANCEL key to start again.

4.4 Recall Command

To recall a saved preset configuration, press the RECALL key, then the input key that corresponds to the preset you wish to recall (1 – 16). Press the ENTER key to load the preset configuration or the CANCEL key to start again.

4.5 All Off Command

To turn all outputs off simultaneously, hold the CANCEL key for approximately five seconds.

5 CAT5 Serial Control/Command

5.1 RS-232 Protocol

7-bit ASCII: 8 data bits, no parity, 1 stop bit, 9600 bps (9600 8N1).

All commands are Upper Case.

5.2 RS-232 Hardware interface

Label	Signal
TX+	RS-232 Transmit (TD)
TX-	Not Used
RX+	RS-232 Receive (RD)
RX-	Not Used
GND	GND

5.3 Commands:

Command Description	ASCII	Hex
"Output"	"O"	4F
"Preset"	"P"	50
"Recall (Preset)"	"R"	52
"Status Report"	"S"	53
"ID Report"	"?"	3F
"Clear Working Preset"	"C"	43
"Address Configuration"	"A"	41

5.4 Command Strings

A valid command string will begin with a Command character, and terminate with a "Carriage Return" (<CR>). The format is as follows:

5.5 Output Commands

The following Output Command formats shall be used:

Oxx=<CR> : Report an output (x) channel configuration.

Device replies with:

Oxx=yy<CR><LF>

Parameters:

x = Output channel (1 - 16)

y = Input channel assigned to selected output channel (0 = OFF)

Oxx=yy<CR> : Configure an output (x) channel.

Device replies with:

Oxx=yy<CR><LF>

Parameters:
x = Output channel (1 - 16)
y = Input channel assigned to selected output channel (0 = OFF)

5.6 Preset Commands

The following Preset Command formats shall be used:

Pxx=<CR> : Report a preset (x) configuration.
Device replies with:
Pxx=aa,bb,cc,dd,ee,ff,gg,hh,ii,jj,kk,ll,mm,nn,oo,pp<CR><LF>

Parameters:
xx = Preset (0 - 16) – If x = 00, the current (working) configuration is reported.
aa = Output 1 input selection (0 = OFF)
bb = Output 2 input selection (0 = OFF)
:
pp = Output 16 input selection (0 = OFF)

Pxx<CR> : Saves current (working) configuration as a preset (xx) configuration.
Device replies with:
Preset xx Stored! <CR><LF>
Parameters:
xx = Preset (1 - 16)

Pxx=a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p<CR> : Configures a preset.
Device replies with:
Preset xx Stored! <CR><LF>

If x = 00 or if x = a recalled preset, the current working preset is reported as:
P00=a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p <CR><LF>
If xx = a stored preset, the new preset configuration will be saved in preset memory
location xx.

Parameters:
xx = Preset (0 - 16)
aa = Output 1 input selection (0 = OFF)
bb = Output 2 input selection (0 = OFF)
:
pp = Output 16 input selection (0 = OFF)

5.7 Recall Commands

The following Recall Command formats shall be used:

Rxx<CR> : Recall preset (x) and copy to current working preset.

Device replies with:

P00= a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p<CR><LF>

Parameters:

aa = Output 1 input selection (0 = OFF)
bb = Output 2 input selection (0 = OFF)
:
pp = Output 8 input selection (0 = OFF)

5.8 Status Commands

The following Recall Command formats shall be used:

S=<CR> : Report master device status.

Device replies with:

Pxx= aa,bb,cc,dd,ee,ff,gg,hh,ii,jj,kk,ll,mm,nn,oo,pp <CR><LF>
P01= aa,bb,cc,dd,ee,ff,gg,hh,ii,jj,kk,ll,mm,nn,oo,pp <CR><LF>
P02= aa,bb,cc,dd,ee,ff,gg,hh,ii,jj,kk,ll,mm,nn,oo,pp <CR><LF>
P03= aa,bb,cc,dd,ee,ff,gg,hh,ii,jj,kk,ll,mm,nn,oo,pp <CR><LF>
P04= aa,bb,cc,dd,ee,ff,gg,hh,ii,jj,kk,ll,mm,nn,oo,pp <CR><LF>
P05= aa,bb,cc,dd,ee,ff,gg,hh,ii,jj,kk,ll,mm,nn,oo,pp <CR><LF>
P06= aa,bb,cc,dd,ee,ff,gg,hh,ii,jj,kk,ll,mm,nn,oo,pp <CR><LF>
P07= aa,bb,cc,dd,ee,ff,gg,hh,ii,jj,kk,ll,mm,nn,oo,pp <CR><LF>
P08= aa,bb,cc,dd,ee,ff,gg,hh,ii,jj,kk,ll,mm,nn,oo,pp <CR><LF>
P09= aa,bb,cc,dd,ee,ff,gg,hh,ii,jj,kk,ll,mm,nn,oo,pp <CR><LF>
P10= aa,bb,cc,dd,ee,ff,gg,hh,ii,jj,kk,ll,mm,nn,oo,pp <CR><LF>
P11= aa,bb,cc,dd,ee,ff,gg,hh,ii,jj,kk,ll,mm,nn,oo,pp <CR><LF>
P12= aa,bb,cc,dd,ee,ff,gg,hh,ii,jj,kk,ll,mm,nn,oo,pp <CR><LF>
P13= aa,bb,cc,dd,ee,ff,gg,hh,ii,jj,kk,ll,mm,nn,oo,pp <CR><LF>
P14= aa,bb,cc,dd,ee,ff,gg,hh,ii,jj,kk,ll,mm,nn,oo,pp <CR><LF>
P15= aa,bb,cc,dd,ee,ff,gg,hh,ii,jj,kk,ll,mm,nn,oo,pp <CR><LF>
P16= aa,bb,cc,dd,ee,ff,gg,hh,ii,jj,kk,ll,mm,nn,oo,pp <CR><LF>

Parameters:

xx = Current (working) preset If x = 1 – 16 then a stored preset is loaded. If any output configuration is changed after loading a stored preset, then x = 0.
aa = Output 1 input selection (0 = OFF)
bb = Output 2 input selection (0 = OFF)
:
pp = Output 8 input selection (0 = OFF)

5.9 ID Commands

The following ID Command formats shall be used:

? <CR> : Report ID / firmware version
Device replies with:
MX1616 Core vx.y<CR><LF>
MX1616 Panel vx.y<CR><LF>
Parameters:
x = Major firmware revision
y = Minor firmware revision

5.10 Clear Working Preset

This command will turn all outputs off immediately.

C<CR> : Clear working preset
Device replies with:
P00=00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00<CR><LF>

6 Address Configuration Commands

The following Address Configuration Command formats shall be used:

A=<CR> : Report device hardware address configuration.
Device replies with:
A=xx<CR><LF>

Parameters:
xx = Device address

A=xx<CR> : Configure device hardware address.
Device replies with:
A=xx<CR><LF>

Parameters:
xx = Hardware Address (“00” – “99”)

6.1 Address Prefix

The address prefix byte shall be formatted as the binary address value (0x00 : 0x63)+ 0x80.

The address byte shall not be formatted, nor interpreted as an ASCII character.

Examples:

Hardware address = “01”, address prefix = 0x81

Hardware address = “99”, address prefix = 0xE3

All command strings **must** be preceded by an address prefix byte when operating in addressable mode.

6.2 Notes

1. All commands (except the address prefix byte) are “echoed” at the terminal prompt.

2. Any invalid command sequences will return an error prompt / string.

3. In addressable mode (RS-485 ONLY), each command string **must** be preceded by an address prefix byte.

LIMITED WARRANTY

Kramer Electronics (hereafter *Kramer*) warrants this product free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

Labor and parts are warranted for three years from the date of the first customer purchase.

WHO IS PROTECTED?

Only the first purchase customer may enforce this warranty.

WHAT IS COVERED AND WHAT IS NOT COVERED

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by Kramer, or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the Web site www.kramerelectronics.com.
2. Any product, on which the serial number has been defaced, modified or removed.
3. Damage, deterioration or malfunction resulting from:
   i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
   ii) Product modification, or failure to follow instructions supplied with the product
   iii) Repair or attempted repair by anyone not authorized by Kramer
   iv) Any shipment of the product (claims must be presented to the carrier)
   v) Removal or installation of the product
   vi) Any other cause, which does not relate to a product defect
   vii) Cartons, equipment enclosures, cables or accessories used in conjunction with the product

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items. We will not pay for the following:

1. Removal or installations charges.
2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
3. Shipping charges.

HOW YOU CAN GET WARRANTY SERVICE

1. To obtain service on you product, you must take or ship it prepaid to any authorized Kramer service center.
2. Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).
3. For the name of the nearest Kramer authorized service center, consult your authorized dealer.

LIMITATION OF IMPLIED WARRANTIES

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

EXCLUSION OF DAMAGES

The liability of Kramer for any effective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1. Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or:
2. Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.

NOTE: All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.

This equipment has been tested to determine compliance with the requirements of:

EN-50081:	"Electromagnetic compatibility (EMC); generic emission standard. Part 1: Residential, commercial and light industry"
EN-50082:	"Electromagnetic compatibility (EMC) generic immunity standard. Part 1: Residential, commercial and light industry environment".
CFR-47:	FCC Rules and Regulations: Part 15: "Radio frequency devices Subpart B Unintentional radiators"

CAUTION!

- Servicing the machines can only be done by an authorized Kramer technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.
- Use the supplied DC power supply to feed power to the machine.
- Please use recommended interconnection cables to connect the machine to other components.

For the latest information on our products and a list of Kramer distributors, visit our Web site: www.kramerelectronics.com, where updates to this user manual may be found.
We welcome your questions, comments and feedback.

Safety Warning:
Disconnect the unit from the power supply before opening/servicing.

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